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RESEARCHES

ON

THE CHEIROPTERA

OF THE

UNITED STATES.

BY WILLIAM COOPER.

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Descriptions *of Five Species of* Vespertilio *that inhabit the Environs of the City of New-York.* By William Cooper.

Read February 6, 1837.

The difficulty of determining the species of Bats is well known to zoologists. It is but recently that those belonging to Europe have been settled with some degree of accuracy, and it is not to be expected that the American species should be already so well known as to leave no room for further investigation. The *Mammalogie* of Desmarest, the latest general catalogue, contains descriptions of but three species from the continent of North America, those published by Rafinesque being considered by that author as too little known and too imperfectly described to be included in his text. Subsequent writers, especially Say, Le Conte, Harlan, have made known several others, so that the list of nominal species of Cheiroptera belonging to the United States now comprises thirteen, without including those of Rafinesque, or the *Rhinopoma carolinensis* of G. St. Hilaire, which has not been since observed, and is admitted by the author himself to be very doubtful as an American species. These thirteen species have been referred to the genera *Vespertilio*, *Nycticeius*, *Taphozous* and *Plecotus*.*

My object in the present communication is to establish and clear up the synonymy of several species which I have observed in this vicinity, and by means of more extended de-

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* In a report on the Zoology of North America, read to the British Association by Dr. Richardson, at their late meeting in August 1836, he assigns sixteen species of Cheiroptera to North America. Not less than twenty-four have been described or indicated under separate names by authors, of which eleven are by Rafinesque.

scriptions and comparisons than have been heretofore given, to enable the student to determine them with as little difficulty as their close resemblance will permit. The materials for doing this have been derived partly from my own researches during several years past, and partly from the liberal communications of my friends, especially Major Le Conte of this city, the Rev. Dr. Bachman of Charleston, and Doctors Pickering and Morton of Philadelphia. Through their assistance I have likewise been enabled to make some interesting observations relative to other groups of this family, which I propose to communicate as I find opportunity to prepare them for publication. I hope in this manner to lay the groundwork for a complete account of the Cheiroptera of the United States, which however much to be desired, I have not at present the requisite materials to undertake.

1. Vespertilio pruinosus.

Vespertilio pruinosus, Say in Long's Exp. I. p. 168. Richardson, Fauna Bor. Am. I. p. 1.

Nycticeius tesselatus, Raf.?

Hoary Bat, Godman, Am. Nat. Hist. I. p. 68. Pl. I. fig. 3. Rich. l. c.

Description.

In the general appearance of the upper parts it much resembles the common Red Bat, though more variegated in color. The ears are of moderate size and rounded, hairy above next the head, with a naked anterior lobe; the inside also hairy, except on the outer portion and round the border; tragus hairy, irregularly triangular, obtuse and arquated, with the outer angle curved forward and the inner attached. About the ears and front the color of the fur is a pale tawney, the remaining upper parts of the body including the flanks and interfemoral membrane, except a narrow edging round the latter, of a dark ferruginous, intermixed with dusky black on

the back, and all tipped with white, giving it a peculiarly hoary aspect. There is a small whitish hairy patch near the first or elbow joint of the wing membrane, and another at the base of the thumb, and in some, a third at the base of the fourth phalanx, the remainder of the membrane above being naked. Beneath, the lips and lower jaw are dusky black, throat and neck pale yellowish. At the insertion of the wings is a white mark as in V. noveboracensis, on each side, between which the fur is dusky brown tipped with white, like the upper parts. Lower down it becomes much mixed with pale tawney, which predominates on the flanks, and extends, forming a hairy border of half an inch wide up the membrane, to the origin of the phalanges. The remainder of the wing and interfemoral membranes naked.

The sides of the interfemoral membrane are sustained by a bony process (os calcis ?) three fourths of an inch long, projecting in a curved line, and articulated with the tibia. This is not peculiar to the species, but is more than usually apparent.

Incisors $\frac{1-1}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{4-4}{5-5}=30$.

Total length - - - - - - -	4 . 8 inches.
Tail - - - - - - - - - -	1 . 8 "
Fore arm - - - - - - - - -	2 . 0 "
Tibia - - - - - - - - - -	0 . 9 "
Spread - - - - - - - - - -	15 . 0 "

I have no doubt of the identity of this Bat with the *pruinosus* of Say, as well as of Richardson, who has described its external markings with minuteness and accuracy. The difference in size remarked by Dr. Richardson in his specimen is not greater than I have observed between different specimens of the smaller species ; but the dental formula given by him, is materially unlike that which I, after repeated examination, have laid down as above. In fact, this and the following species agree strictly in all the peculiarities of their dental system,

both as to the kind and number of the teeth, and form together a small natural group, the *Nycticeius* of Rafinesque, which however I have not thought it expedient to adopt as a genus, as they differ so little in habit and external characters from our other Vespertiliones. The external resemblance between these two species is also very great, so that they might be confounded without a close inspection of the markings. But the Hoary Bat is much larger; besides, as Say observes, many minor differences, of which the most conspicuous are the black lips and chin, and buff-colored cravat of this species. The hairy patch near the elbow joint I have not found in any instance in the New-York Bat, and in all the varieties of this latter there is an obvious reddish tinge, approaching sometimes to lake, on the under parts (as well as upper) of which there is no appearance whatever in the large species. The white mark at the insertion of the wings is found in both.

Though first described by Mr. Say from a specimen obtained beyond the Mississippi, there is now reason to believe that this fine species is common in the Atlantic States. Previously to the expedition of Major Long it had been captured in Philadelphia, and a specimen from Georgia has been communicated to me by Major Le Conte, and another by Dr. Bachman from Charleston, South Carolina. That from which the above description is chiefly drawn up, was shot by Mr. J. F. Ward, in the month of November, near the heights of Weehawken, in New Jersey, near this city, in broad daylight. It was hovering and fluttering about the precipice in the manner of other Bats, and occasionally darting towards the low grounds, more like a bird. I have witnessed at the same locality the similar evolutions of a Bat, probably of this species, that was flying about early one fine afternoon, though it kept below the shadow of the rocks. It is not improbable that it migrates hither from the north, Dr. Richardson having met with it in lat. 54°.

2. Vespertilio noveboracensis.

New-York Bat, Penn. Syn. p. 367. Idem Arct. Zool. I. p. 184.
Vespertilio noveboracensis, Gmel. Syst. I. p. 50 sp. 21. Geoffroy St. H. in Ann. Mus. 8. p. 203. Harlan, Fauna Am. Idem, Month. Am. J. I. p. 220. Godman, Am. Nat. Hist. I. p. 68.
Red Bat of Penn. Wils. Am. Orn. VI. pl. 50 p. 60.
Taphozous rufus, Lesson, Man. Mamm.
Nycticeia noveboracensis, L. C. in App. to Mc Murtrie's Cuvier, I. p. 441.

Description.

Ears short, roundish, naked on the anterior half above, and furnished merely with a thin covering of fine hairs within. Color of the fur above reddish tawney, in some individuals deep, and more properly ferruginous; in others very light-colored: the base is of a light ochreous tint, towards the end it is reddish tawney, ferruginous, or lake, and often finely tipped with white, giving it a slightly hoary or cream-colored appearance, according to the predominance of one or the other of these tints. The reddish tawney always predominates on the interfemoral membrane, which, and the feet, are densely hairy down to the very edge. The wing membranes are entirely naked above, with the exception of a small spot at the base of the thumb, and about the base of the fore finger, which in some individuals extends half an inch down each side of the phalanx, though in others there is scarcely a trace. At the insertion of the wings is a white mark, most conspicuous on the under side. Beneath, the colors are similar to those of the back, though paler; a hairy border extends along the anterior side of the membrane to the divergence of the phalanges. This part of the membrane is light yellow or tawney, while the rest is dusky both in this and the preceding species.

Incisors $\frac{1-1}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{4-4}{5-5}=30$.

Total length - - - - -	from	3.0 - to	3.8 inches.
Tail, about - - - - - -	"	1.3 "	1.5 "
Fore arm - - - - - -	"	1.3 "	1.5 "
Tibia - - - - - - -	"	0.7 "	0.8 "
Spread - - - - -	"	10.0 "	11.0 "

There has been much disagreement among authors respecting the dental system of this Bat. Say first detected the error of Pennant, who thought it had no upper incisors. F. Cuvier is the only author who has given a complete dental formula for the species, but it is not correct.* Desmarest, following Rafinesque, arranges the *V. noveboracensis* under the genus *Atalapha*, characterized by the total absence of incisors! The above formula may be relied on, having been carefully verified by my own repeated examinations, and confirmed by the notes communicated by Major Le Conte.

The Red Bat of Pennsylvania, figured in the sixth volume of Wilson's Ornithology, is no other, as Godman has remarked, than this species, and one of the lighter colored varieties. Lesson, an industrious French naturalist, concluded from Wilson's account of its dental system, that it belonged to the African genus *Taphozous*, in which he has been followed by Cuvier in his second edition, with what reason may be inferred from our description. In effect the incisors rise so little above the gum, and even in prepared skulls the lower are so minute and so crowded together, that the most careful inspection with a lens is requisite to detect the actual number.

The Red or New-York Bat is common over a great extent of country, including the southern and middle states, and the western to near the Rocky Mountains, where it was met with by Major Long's party. During winter it remains in a torpid state in caverns and similar places, where it has been found at

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* Dents des Mammifères, p. 48.

this season in the States of New-York and Pennsylvania. In summer it is frequently discovered in woods suspended during the day by its thumb claws to a twig behind a cluster of leaves. Its habits are in other respects similar to those of its tribe. The female is larger than the male, and produces four or five young at a birth, though others of the genus are said to have but one.

V. borbonicus of Geoffroy is no doubt a very different species, as well as *V. lasiurus* of Schreber, also figured by Geoffroy, unless we suppose the ears to be very incorrectly represented by these authors.

3. Vespertilio noctivagans.

Vespertilio noctivagans, L. C. in App. to Mc Murtrie's Transl. of Cuv. R. An. I. p. 431.
Vespertilio Audubonii, Harlan, in Am. Monthly Jour. of Geol. p. 220. pl. IV.
Silver haired, or Audubon's Bat.

Description.

Ears dusky black, rather large, naked on the anterior portion, somewhat ovate and obtuse, with two emarginations on the outer posterior border, produced by two plaits; naked within, and with the tragus moderate, ovate, and obtuse. Color above, a uniform dark dusky brown approaching to black. On the back the fur is somewhat glossy and tipped with silvery white, forming an interrupted line across the shoulders, and thence irregularly mixed down the centre of the back. Interfemoral membrane thickly hairy on the upper part, becoming thinner downward and naked near the border. Tip of the tail projecting about a line beyond the membrane. Feet hairy. Wing membrane entirely naked. Beneath very similar to the upper parts, though the light-colored tips of the hairs are more yellowish.

Incisors $\frac{2-2}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{5-5}{5-5}=34$.

Total length - - - - - - - - - - -	3.8 inches.
Tail - - - - - - - - - - - - - -	1.5 "
Fore arm - - - - - - - - - - - -	1.8 "
Tibia - - - - - - - - - - - - -	0.8 "
Spread - - - - - - - - - - - - -	11.0 "

This species is easily recognised at sight by its dark black-brown fur tipped with white on the back, and it cannot be confounded with any other of our Bats by the most heedless observer. It was first described in the year 1831, both by Major Le Conte and Dr. Harlan. The preface to the volume in which the former gentleman's description appears is dated in June; that of the latter is contained in the Journal of Geology for November of the same year. These dates are my only guide in deciding the claim to priority in favor of Major Le Conte, by adopting his name for this species.

The Silver-haired Bat is rare in our vicinity, and I have only obtained it from Long Island, where it is found during the day in hollow trees. I have seen a considerable number, which were remarkably uniform in their appearance. They are probably more common in the southern states, where they have been observed by Major Le Conte.

4. Vespertilio carolinensis.

Vespertilio carolinensis, Geoffroy St. Hilaire, in Ann. du Museum, 8 p. 193, sp. 2. figs. of the head and cranium pls. 47 and 48. Le Conte, in App. to Mc Murtrie's Cuv. I. p. 431.

Description.

Ears large, naked, except near the head, and with a broad and obtuse tip curving outwards; emarginate on the outer posterior edge, tragus nearly a line broad, linear and obtuse,

and as well as the inside of the ears, destitute of hairs. All the upper parts of the head and body are covered with close soft and glossy fur, of a uniform brown color approaching to chestnut. Beneath the fur is of a pale dingy ochreous or yellowish. The remaining parts are all naked with the exception of a few scattered hairs on the toes. Last joint of the tail free. Bony process supporting the membrane very apparent.

Incisors $\frac{2-2}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{4-4}{5-5}=32$.

Total length	3.8 inches.
Tail	1.5 "
Fore arm	1.8 "
Tibia	0.8 "
Spread	11.5 "

Though apparently well known to the French naturalists, no American author who has written upon these animals appears to have been acquainted with this species, except Major Le Conte, as above cited. It is common in Carolina and Georgia, and rather numerous on the south side of Long Island, whence I have frequently procured it.

5. Vespertilio subulatus.

Vespertilio subulatus, Say in Long's Ex. II. p. 65. Richardson Fauna B. A. I. p. 3.
Vespertilio lucifugus, L. C. in App. to Mc Murtrie's Cuv. I. p. 431.
Atalapha fuscata, Raf. ?
Vespertilio domesticus, Green, in Cab. N. H. II. p. 290.
Say's Bat, Richardson loc. cit.

Description.

Ears rather large, naked except at the very base, narrowed somewhat at tip, and obtuse, tragus linear, subulate, subacute. The fur is fine and soft, of a grayish or cinereous brown color above, beneath pale yellowish mixed with dusky. The re-

maining parts are naked like the preceding species, the membranes more delicate in texture and less dusky, and the tail all engaged in the interfemoral membrane.

Incisors $\frac{2-2}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{6-6}{6-6}=38$.

Total length	3.2 inches.
Tail	1.3 "
Fore arm	1.3 "
Tibia	0.7 "
Spread	9.3 "

Say's Bat, and the Carolina Bat have a strong external resemblance, and might be mistaken for each other, though there is considerable difference in size, which, with the different form of the tragus will enable the student to discriminate between the two species. The dental systems, it will be observed, are very unlike. That of *V. subulatus* is correctly described by Dr. Richardson, as I have carefully verified. From the specimens and MS. notes communicated to me by Major Le Conte, I am satisfied of the identity of this with his *V. lucifugus*, to which he also assigns the same dentary system.

This species, first made known by Mr. Say, in the notes to the account of Long's first expedition, was afterwards more minutely described by Dr. Richardson, who found it the most common species of Bat near the eastern base of the Rocky Mountains, and Mr. Townsend has recently brought it from Columbia river. A specimen obtained by Dr. Pickering in the mountains of New Hampshire, is preserved in the cabinet of the Academy of Natural Sciences, and I have seen another procured by Mr. Audubon, in Labrador. I have a specimen from Pittsburg, on the Ohio. In our vicinity, and in the city itself, it is pretty common. Major Le Conte, and Mr. Bachman, have communicated specimens from Georgia and Carolina. It is therefore, though one of the latest known, at the same time one of the most widely diffused over the United States.

Professor J. Green, has given in Doughty's Cabinet of Natural History some interesting particulars concerning a small species of Bat, *V. domesticus*, which appears from his description to be identical with this. He observed it to resort in great numbers to a deserted frame building, concealing itself during the day between the boards and the plaster walls, all entering and issuing by one small aperture. This was in western Pennsylvania.

I here wish to corroborate the remark of Professor Green, that the number of incisors, at least in our Bats, is a permanent character. I have seen nothing to favor the idea entertained by several distinguished naturalists, that any of the teeth are deciduous, but on the contrary have observed them to retain the entire number until quite worn with use.

On Two Species of Molossus *inhabiting the Southern United States.* By William Cooper.

Read February 20, 1837.

The great Prussian zoologist Pallas, in his *Spicilegia Zoologica*, Fascicle IV. p. 8, suggests the name of *Molossus* for a South American Bat, which had been previously made known by Buffon and Daubenton, giving at the same time a figure of the cranium, and pointing out some peculiarities in its dentary system which distinguished it from all the other then known species. Accordingly it became the *Vespertilio molossus* of Gmelin, in whose *Systema* it forms a distinct section, characterized as already indicated by Pallas.

M. Geoffroy St. Hilaire having undertaken a revision of the great genus *Vespertilio*, proposed in the sixth volume of the *Annales du Muscum*, the *V. molossus* of Pallas and Gmelin as the type of a separate group, for which he adopted the name of *Molossus*, and added several other species, all natives of South America. Illiger afterwards changed the name of this genus to *Dysopes*, which is also employed by M. Temminck in preference to the original name, but as the alteration seems to have been introduced without sufficient necessity, we shall with Cuvier adhere to that first proposed by Pallas.

This genus, extended so as to include the *Nyctinomus* of Geoffroy, forms the subject of an excellent memoir in the *Monographies de Mammalogie* of Temminck. *Nyctinomus* was originally founded on an Egyptian Bat, and the species were for a time supposed to be confined to Asia and Africa, until M. Geoffroy the younger himself referred to the same genus the *Molossus nasutus* of Spix, under the name of

Nyctinomus brasiliensis. The geographical distinction being thus done away with, and M. Temminck finding in the young *Molossi* all the characters of the *Nyctinomi* has united them in one. The *Dinops* of M. Savi, founded on a species observed in Italy, there appears reason to believe is also a species of *Molossus*, which thus proves to inhabit every quarter of the old continent.

The fact of the existence of this genus in North America, and especially so far north as the United States, has not been hitherto made known, or scarcely suspected. Among several collections of Bats from Carolina and Georgia that have been recently submitted to my inspection, I find two apparently distinct, which are clearly species of *Molossus*, and much related to some of the smaller ones so well illustrated in the work of M. Temminck.

1. Molossus cynocephalus.

Plate III. Fig. 1. the head. fig. 2.

Nycticea cynocephala, Le Conte in App. to Transl. of Cuv. R. A. I. p. 442, sp. 3.

Rhinopoma carolinensis, Geoff.? Desm. Mamm. p. 130?

Description.

Color entirely sooty brown, darker above, paler beneath. Ears with a very short rounded tragus, and remarkable for being singularly and regularly crimped or fluted on their posterior half. Numerous stout bristles about the face. Muzzle broad, and lips thick and pendant, giving the ferocious expression characteristic of the genus. The wings long, and sufficiently ample; the interfemoral membrane naked, and partly sustained by a slender bony process from the hind foot, the tail extending half an inch beyond it. The tibia and fibula short and robust, and included in the membranes their whole

length. Toes nearly equal in length, the two outer rather more robust, and woolly on the outside, and all furnished with fine long hairs springing from the roots of the nails, and forming a fringe on the inner side of the foot. The fur is of a close and velvetty texture, unlike the loose and long pelage of the northern Vespertiliones.

Incisors $\frac{1-1}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{5-5}{5-5}=32$.

Total length	3.3 inches.
Tail	1.3 "
Fore arm	1.7 "
Tibia	0.5 "
Spread	10.5 "

I have described this Bat from a specimen furnished to me by Major Le Conte. The first and only notice of the species hitherto published is that given by this gentleman as above quoted, unless it be the doubtful *Rhinopoma carolinensis*, as supposed by my friend Dr. Pickering. There is however no appearance of any nasal appendage whatever, and it exhibits no other affinity with that genus. Major Le Conte obtained it in Georgia, where as he informs me he has observed it in large numbers together. Dr. Bachman has also sent me several specimens, and states that it is common about Charleston, though he had not observed it elsewhere. No other writers appear to have met with it. The curious crimping of the ears is found in another species from Java, the *Dysopes tenuis* of Temm. Monog. I. p. 228, pl. 19, fig. 2. The dentary formula is derived from the MS. notes communicated by Major Le Conte.

2. Molossus fuliginosus.

Plate III. Fig. 3. The head, fig. 4.

Dysopes obscurus, Temm. Monog. I. p. 236, pl. XXII. fig 2.?
Rhinopoma carolinensis, Geoff.? Desm. Mamm. p. 130?

Color sooty brown, paler beneath, ears blackish, wings dusky. Ears very broad and ample, occupying the whole side of the head, but not crimped like the preceding. Tragus small, but obvious. Muzzle prominent, face set with long hairs, lips full, but less so than in the former species. Wings long and ample for the genus, with close, scattered, short whitish hairs on the under side. The interfemoral membrane naked, and extending a quarter of an inch further than the wing membranes down the tibia, and terminating in a border, the wing membrane ending abruptly. The tail is robust, extending seven-tenths of an inch beyond the membrane. Outer toes fringed, and all furnished with a few long hairs like the former species. The fur is also similar, much resembling that of a common mole or scalops.

Incisors $\frac{1-1}{4}$ canines $\frac{1-1}{1-1}$ molars $\frac{5-5}{5-5}$?=30.

Total length	3.5 inches.
Tail	1.4 "
Fore arm	1.5 "
Tibia	"
Spread	9.6 "

I have seen but a single specimen of this species, which was sent to the Lyceum of Natural History by Dr. Boykin, of Milledgeville, Georgia, where it was procured, and it appears to be altogether unknown to naturalists. With the exception of the legs, from which the bones had been removed and the skin unnaturally stretched, the specimen is in good preserva-

tion, and so prepared that most of the teeth can be examined without injury to it.

The *Dysopes obscurus* of Temminck bears a close resemblance to our species, and may possibly prove to be the same, when better materials for comparison shall be obtained. The description of *Rhinopoma carolinensis* applies equally to this species with the former, and in the number of lower incisors it corresponds still better with it. See Desmarest, *Mamm.*

In order that naturalists may judge with what degree of propriety I have referred these Bats to the genus *Molossus*, and at the same time to complete their description, I shall subjoin the characteristics of that remarkable genus, as laid down by Temminck in his Monography, a work drawn up with great care from materials obtained by the examination of all the principal cabinets of Holland, France, England and Germany.

DYSOPES. Illig. Temm.

Vespertilio, Linn. Gmel. *Molossus*, Geoff. Cuv. Desm.
Nyctinomus, Geoff. Desm. *Cheiromeles*, Horsf. *Dinops*, Savi.

Incisive teeth variable in number with age, $\frac{2}{0}$, $\frac{2}{2}$, $\frac{2}{4}$, or $\frac{2}{6}$, or even $\frac{4}{6}$ in youth. The adult has constantly two upper incisors more or less apart, and converging towards the point. The lower small, bilobed, much crowded, (inferiores 6 conferti, LC.), and all or part of them falling out from the excessive development of the heel (or basal process) of the canine.

Canine teeth $\frac{2}{2}$, the upper large, channeled in front, the lower as it were grafted on an immense heel touching, *in the adult*, exactly at the base, but spaced *in the young*, so as to lodge the incisives.

Molar teeth $\frac{4}{5}$; in some species a fifth tooth, or little rudimentary point, scarcely visible, between the canine and the first upper molar (molares superiores 5, anterioribus minutis, LC.)

The total number of teeth very variable with age, so as to

serve to distinguish some species: the maximum is 32 or 34, and the minimum 24 or 26.

M. Temminck observes, that notwithstanding these differences in the teeth, there is no genus of animals, *Felis* and *Pteropus* perhaps excepted, more natural than that of *Dysopes* or *Molossus* in his view of it. He then gives the following natural character as first drawn up by Geoffroy, with some additions of his own.

"They may be easily recognised by their savage physiognomy and the whole expression of their countenance; their large head and broad muzzle had caused them to be compared to a bulldog, and designated under the name of Molossus; their head is moreover increased in size by the ears, inclined over, and almost resting upon the eyes, and appearing more fit to protect the organ of sight, than to favor the perception of sound; they originate very near the commissure of the lips, and after passing behind the auditory opening, they return forwards to unite together on the forehead. The greater part of the Cheiroptera have the tragus of the ear placed in the auditory opening, it forms a sort of second inner ear, which then receives the name of auricle; the Molossi differ from them by having this auricle situated forward and outside: it is round and pretty thick: in fine, the species of this genus may be further recognised by their tail, which is long, but with only one half engaged in the interfemoral membrane. Their tongue is soft; their muzzle not furnished with bristles; and their nose has none of those membranes or funnel shaped cavities which distinguish the Vampyres, the Phyllostomes, &c. The nostrils are a little prominent, open in front, and bordered by a raised edging. All the species have the hinder limbs very short, the fibula perfect, often as thick as the tibia, and suited by their divergence to serve for the attachment of the vigorous muscles of their feet; their toes nearly all equal, with short and very crooked nails; all have silky hairs on their toes; the outer or inner toe of the hind feet more or less free from the others,

and in some degree opposable; the thumb of the wing very short, strong and broad; the upper lips ample, with numerous folds, the nostrils placed in a muzzle projecting beyond the lips; but what is still more characteristic, is the apparent insufficiency of the flying membranes, entirely disproportioned to the volume of their large and heavy body; their wings, with narrow and deeply cut membranes, are so disproportioned in some species, that one would say that the animal could scarcely make use of them to transport himself to a distance, and that they merely served as a parachute. Their hind feet are very short, the tibia and fibula well separated for their whole length, and of nearly equal thickness; their muscles are vigorous, the toes armed with hooked nails, and the outer or inner toe free and entirely separated from the others."

This description applies with remarkable exactness to both the *Cheiroptera* now under consideration, and the resemblance becomes still more obvious when we compare them with the excellent plates given by Temminck; where may be found figured several species of similar dimensions, and otherwise closely allied to them, which inhabit Brazil and other parts of South America. From all these they may be readily known, *D. cynocephalus* by its crimped ears, and *D. fuliginosus* by its long legs and long and robust tail. The former differs moreover from all the genus in the short stiff bristles about the face, of which however a few are observed on the *D. cheiropus* of India.

What Temminck remarks relative to the insufficiency of their organs of flight is not applicable to them nor the other smaller American species. The wings are indeed narrow in comparison with the Vespertiliones, but long, and no doubt capable of a protracted flight.

I regret that I can furnish no particulars of the habits of these singular animals, but the attention of our naturalists being now turned to the subject, it is to be hoped that the most ample details concerning them will not long be wanting.

On Two Species of Plecotus *inhabiting the United States Territory.* By William Cooper.

Read April 3, 1837.

Although the species which afford the type of this genus or group of Cheiroptera, are sufficiently striking in their appearance, and are common in the populous parts of Europe, it was not until the publication of the great work on Egypt that they were first proposed by G. St. Hilaire as distinct from the ordinary *Vespertiliones*. The only ones then known were two European, and one from the island of Timor. They are characterised, besides what is common to them with the other Bats, by the union of the base of the auricular conchs, which are always remarkably ample, and sometimes enormous. Our North American species, as we shall presently find, are further distinguished by two large fleshy appendages in the form of crests, situated between the eyes and nostrils.

Mr. Isidore G. St. Hilaire, published in March 1832, a valuable memoir on this genus, in which he enumerates eight species from various and remote parts of the globe. He subdivides them into those with ears of enormous size, (in some instances as long as the entire body,) and those which are merely ample. In the first he places four species, of which three are found in Europe, one being also common to Egypt, and the fourth brought from the southern hemisphere by Peron. Of those belonging to the second subdivision one is European, one Asiatic, and the two others American, one being from the island of Porto Rico and the other from Brazil. This last is much the largest of the known species, and the *Vespertilio*

(Plecotus) Maugei of Porto Rico, is the only one which can be suspected of any specific similarity with those we have here described. But if it be in reality identical with one of ours, the description at present extant must be both too inaccurate and too incomplete to supersede the necessity of a new one.

1. Plecotus lecontii.

Plate III. Fig. 5. the head.

Plecotus macrotis LC. in App. to Mc Murtrie's Cuv. 1. p. 431.
Vespertilio Maugei, Desm. Mamm. p. 145? Idem Nou. Dict?
Plecotus Maugei, Is. Geoff. Mag. de Zool. 1832?
Longhaired Bat, Penn. Arct. Zool. 1. p. 184. Clayton in Phil. Trans.

Description.

Color of the back dusky, terminated with light brown, appearing somewhat variegated if the hairs be disturbed, fur long, soft and close. The remaining upper parts are naked, with the exception of the base of ears behind, and their anterior lower border, which is fringed with fine soft hairs, and a few long fine hairs at the toe joints; the membranous parts of a uniform light brown like the back. The ears are larger than the head, and half as broad as long, the auricle less than half the length of the ears, narrow, sublinear, obtuse, and curving slightly outward. The nose round, set with numerous fine long hairs, and "a very large erect cristiform warty excrescence on each side between the eyes and the nose." The under side of the body clothed with fur, which is very dark dusky at the base with very light gray tips, which predominate over the dusky more and more downward until it becomes between the legs almost a pure white. Tail slightly projecting beyond the membrane.

Incisors $\frac{4}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{5-5}{6-6}=36$.

Total length	3.4 inches.
Ears, (in the dried sp.)	1.0 "
Tail	1.7 "
Fore arm	1.6 "
Tibia	0.8 "
Spread	10.0 "

The *Vespertilio Maugei* of Desmarest, described from a specimen brought from Porto Rico by Maugé, appears from his description greatly to resemble this above described. The discrepancies, which may be owing to his having only a preserved specimen, are nevertheless too great to allow us to admit their identity without great doubts. Major Le Conte procured it in Georgia, where it appears to be tolerably common, and Dr. Bachman has also sent it to me from Charleston.

Clayton's " Bat with long hair and great ears" appears to be this species.

The name *macrotis* I have ventured to supersede, as being in nowise distinctive of the species, but in reality derived from a generic character, which in some species is still more developed than in the present. The ears being therefore rather *small* for the genus, this name becomes contradictory; and no American naturalist will regret the opportunity thus afforded of paying a well merited tribute to the discoverer of so many rare and remarkable animals of this country.

2. Plecotus Townsendii.

Plate 3. Fig. 6, the head.

Description.

Fur on the back dusky at base, brown at the tips, with a ferruginous cast, the two tints appearing nearly uniform, and

not strongly contrasted as in the preceding species. The ears are also fringed with fur in the same manner. Beneath, the fur is of a reddish cinereous or ochreous hue, lighter towards the tail, but not in the least whitish. The nose is similar, but the fleshy crests between the eyes and nostrils appear to be still larger, and in the preserved specimens are much more conspicuous. The ears are similar, though every way more ample in the present, and presenting a different outline immediately after rising from the forehead; the auricle broader and larger. The wing and tail membranes are entirely naked, dusky, of a thicker texture, and much more strongly reticulated than in the first species.

Incisors $\frac{4}{6}$ canines $\frac{1-1}{1-1}$ molars $\frac{5-5}{6-6}=36$.

Total length	3.8 inches.
Ears	1.1 "
Tail	1.7 "
Fore arm	1.8 "
Tibia	0.8 "
Spread	11.0 "

Three specimens of this very distinct new species were brought from the Columbia river by Mr. John K. Townsend, where he procured them on his late journey in company with Mr. Nuttall. It is very like the *P. Le contii*, but they may be readily known by the color of the under part of the body, besides which they differ in almost all their details of color and proportions, the present being a larger and more robust animal. Together they seem to form a small group in the genus, characterized by the double fleshy crest of the nose, which is not mentioned as occurring in any other species.

I regret being obliged to describe these two Bats from dried specimens, in which state the most characteristic marks especially about the head, are often difficult to detect, whatever pains are taken. I have used in describing the head of the

first species, the language of Major Le Conte, from whose notes I have also copied the dental formula.

Vespertilio megalotis, Raf., *Plecotus Rafinesquii*, Lesson, which is described as having the auricle as long as the ears, cannot be either of our species. I am not acquainted with any other species within the United States.

Discovery of the Vauquelinite, a rare ore of Chromium, in the United States. By J. Torrey.

Read April 27, 1835.

About five years ago some specimens of lead ores were presented to me for examination by Professor Moore of Columbia College. They were taken from a mine near the town of Singsing, in the state of New-York, about one mile south of the State Prison. The mine had been wrought for silver nearly as long ago as the period of the American revolution, and has occasionally been opened since that time. In 1827 a company was formed for the purpose of working it, under the impression that it contained a rich vein of silver. In Cleaveland's mineralogy (ed. 2, p. 536) native silver is said (on the authority of Col. Gibb's) to occur at Singsing, in a very small vein. Mr. F. Cozzens obtained a specimen of the native metal in that locality in the year 1825. The company just alluded to, had the old shaft cleared out, and also made, I believe, a horizontal opening communicating with the shaft, from the side of the hill. A few barrels of ore were taken up, and the enterprize abandoned. The specimens that I examined consisted of common galena, associated with copper pyrites, crystallized carbonate of lead, malachite, and an ochery looking substance. The carbonate of lead was mostly in small prismatic crystals which had become blackened throughout, probably by the sulphuretted hydrogen disengaged from the decomposing pyrites, but they still retained their high adamantine lustre. Most of the lumps of ore, contained much of the ochery substance, which I found consisted of clay, oxide

Fig. 1.

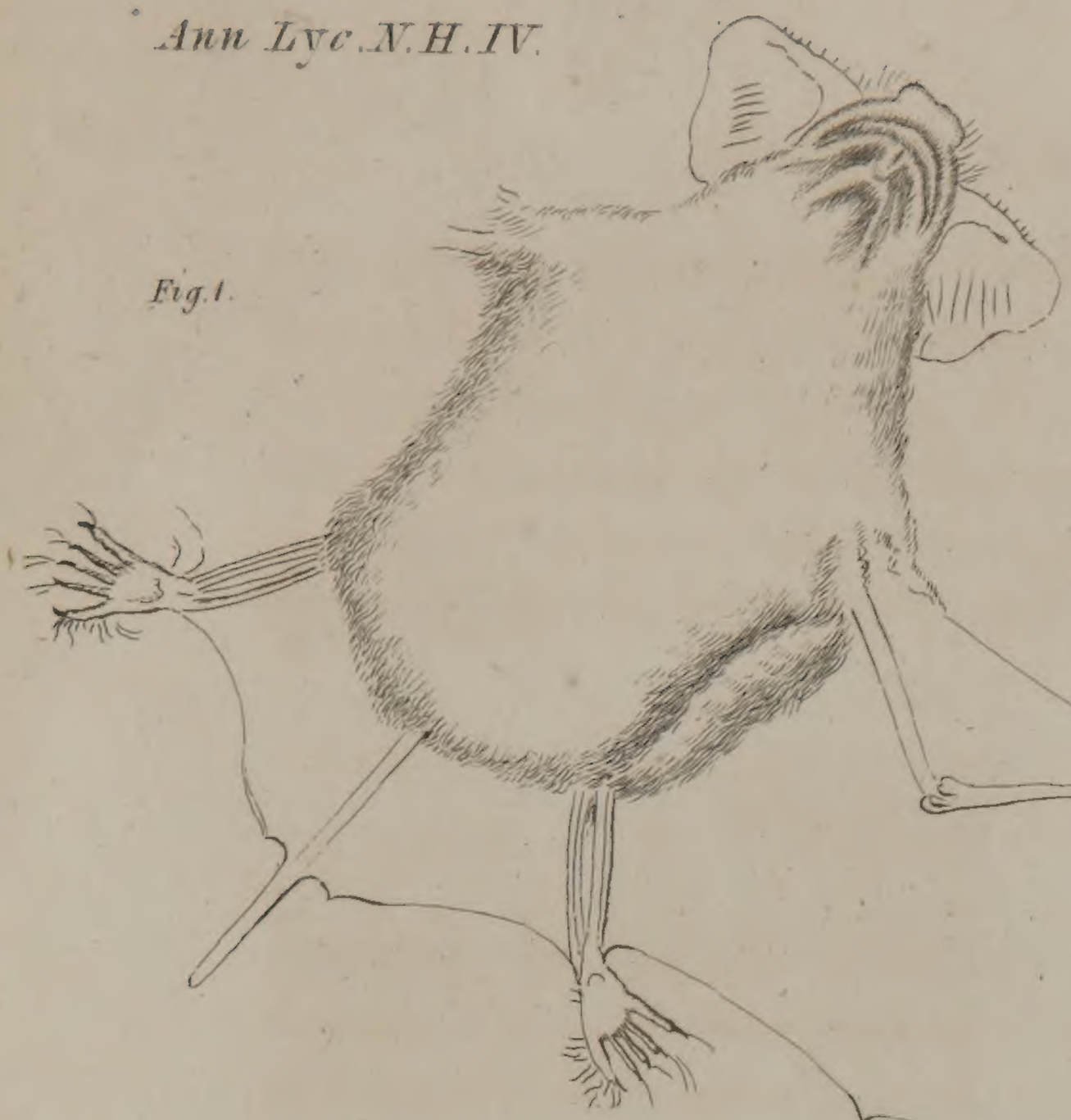
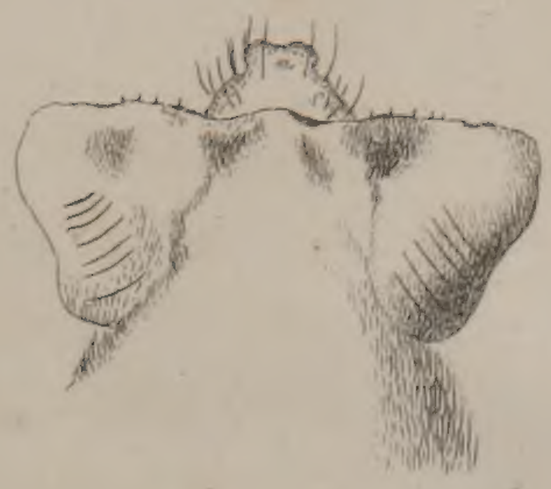


Fig. 2.



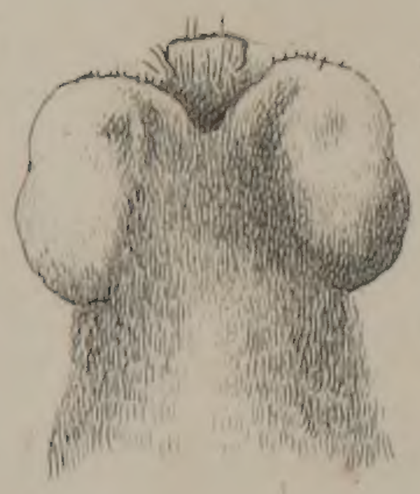


Fig. 4.

Fig 3

Fig. 6.

Fig. 5.